

<b>Interview Summary</b>	Application No.	Applicant(s)	
	10/618,219	BAO ET AL	
	Examiner	Art Unit	
	George A. Goudreau	1763	

All participants (applicant, applicant's representative, PTO personnel):

(1) examiner George A. Goudreau. (3)\_\_\_\_\_.

(2) attorney Daniel R McClure. (4)\_\_\_\_\_.

Date of Interview: 03 October 2005.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☒ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: claims of record.

Identification of prior art discussed: art of record.

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The attorney for applicant called the examiner to discuss the final rejection issued by the examiner. The attorney for applicant agreed to supply additional documentation to the examiner regarding Tawain being a WTO member, etc. in order to vacate the previous rejection of applicant's claims.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

*George A Goudreau*  
GEORGE GOUDREAU  
PRIMARY EXAMINER  
10-3-05

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

#### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

**PATENT  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of:  
Tien-I Bao

Serial No.: 10/618,219

Filed: July 10, 2003

Confirmation Number: 4415

Group Art Unit: 1763  
Examiner: Goudreau, George A.

TKHR Docket No. 252011-1390  
Top-Team Ref. 0503-7148US

For: **METHOD FOR PREVENTING FORMATION OF PHOTORESIST SCUM**

**COMMUNICATION WITH EXAMINER GOUDREAU**

Mail Stop Amendment  
Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Examiner Goudreau:

This submission is made in follow-up to our teleconference of yesterday, and is further to the previous submissions made in this application.

**Taiwan is a WTO Member**

First, you indicated that you needed me to submit proof that Taiwan is a member to the WTO. Attached is a 5-page printout from the WTO web site (see [www.wto.org](http://www.wto.org)), which lists all 148 member countries. Taiwan is identified under the name of "Chinese Taipei." In this regard, I have also attached one page from the accession document for Chinese Taipei (also obtained from the WTO web site) evidencing that "Chinese Taipei" includes the Separate Customs Territory of

Taiwan (among others). This should be sufficient to evidence Taiwan's membership in the WTO, and therefore enable inventors from Taiwan to submit declarations under 37 CFR 1.131.

**Declaration under 37 CFR 1.131**

Also attached is a declaration, which was previously executed by the inventors. I did not submit this with the last response, as I did not believe it was necessary. However, a copy is now provided for your reference. This alone should be sufficient to overcome the outstanding rejections.

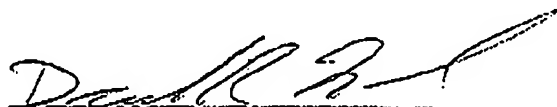
Further, it is my understanding that the cited published application should be removed from consideration, as it does not constitute prior art under 35 USC 102(e) or 103, in that the subject matter that was disclosed (but not claimed) in the published application (and which is claimed in the present application) was invented by the inventors of the present application. As such, the published application does not constitute an invention "by another." Further still, at the time the present invention was made, the inventors were under a duty to assign to the assignee of the published application.

For at least the foregoing reasons, Applicants believe that Notice of Allowance is warranted. At your request, this submission is being made to your private facsimile number (571-273-1434) If I need to formally submit this to facsimile number (571) 273-8300 or by mail, please let me know.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

By:



Daniel R. McClure  
Registration No. 38,962

**Thomas, Kayden, Horstemeyer & Risley, LLP**  
100 Galleria Pkwy, NW  
Suite 1750  
Atlanta, GA 30339  
770-933-9500

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ON THIS PAGE: [Members](#) [Observer governments](#) [International intergovernmental organizations](#)  
[home](#) > [the wto](#) > [what is the wto?](#) > [understanding the wto](#) > [members and observers](#)

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  - Membership, alliances and bureaucracy
  - Secretariat chart
  - Special policies
  - Members list
  - Least-developed countries list
- Abbreviations

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[Antigua and Barbuda](#) 1 January 1995  
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[Benin](#) 22 February 1996  
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[Chile](#) 1 January 1995  
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[Colombia](#) 30 April 1995  
[Congo](#) 27 March 1997  
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[Democratic Republic of the Congo](#) 1 January 1997



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(FYROM) 4 April 2003  
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Guinea Bissau 31 May 1995  
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Togo 31 May 1995  
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1 January 1995  
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Zimbabwe 5 March 1995

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◀ BACK NEXT ▶

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# WORLD TRADE ORGANIZATION

RESTRICTED  
WT/ACC/TPKM/18  
5 October 2001

(01-4741)

Working Party on the  
Accession of Chinese Taipei

## REPORT OF THE WORKING PARTY ON THE ~~ACCESSION OF THE SEPARATE CUSTOMS TERRITORY~~ OF TAIWAN, PENGHU, KINMEN AND MATSU

### I. INTRODUCTION

1. At its meeting on 29 September-1 October 1992, the GATT 1947 Council of Representatives established a Working Party, as reflected in the respective Minutes (document C/M/259), to examine the application of the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu (hereinafter referred to as "Chinese Taipei") to accede to the General Agreement 1947 under Article XXXIII, and to submit to the Council recommendations which may include a Draft Protocol of Accession. Membership of the Working Party was open to all contracting parties wishing to serve on it. Following the request of Chinese Taipei, circulated in document WT/ACC/TPKM/1, and pursuant to the decision of the General Council of 31 January 1995, the Working Party was transformed into a World Trade Organization (WTO) Working Party to negotiate the terms of accession of Chinese Taipei to the Marrakesh Agreement Establishing the World Trade Organization (hereinafter referred to as the "WTO Agreement") under Article XII of that Agreement.

2. The Working Party met on 6 November 1992, 15 April 1993, 28 June 1993, 12 October 1993, 17 May 1994, 26 July 1994, 21 December 1994, 28 February 1997, 8 May 1998, 12 May 1999, and 18 September 2001 under the Chairmanship of H.E. Mr. M. Morland (United Kingdom). The terms of reference and the membership of the Working Party are set out in document WT/ACC/TPKM/6/Rev.6.

### II. INFORMATION PROVIDED

3. The Working Party had before it, to serve as a basis for its discussion, the memorandum on Chinese Taipei's foreign trade regime (L/7097 and Addenda 1-11) and the questions submitted by Members on the foreign trade regime of Chinese Taipei together with the replies of the Chinese Taipei authorities thereto (L/7089/Rev.1, L/7429 and Add.1), and documents Spec(94)28 (Newly Promulgated or Revised Laws and Regulations), Spec(94)30 (Description of Service Sectors), Spec(94)31 and Add.1 (Special Exchange Agreement), Spec(94)41 (Status Report of the Bilateral Negotiations), Spec(95)1 and Corr.1 (Checklist of Accession Issues - Preliminary Responses Provided by Chinese Taipei), Spec(95)8 (Laws and regulations regarding agricultural products), WT/ACC/TPKM/2 (Tariff reductions for 758 tariff lines effected as from 14 July 1995), WT/ACC/TPKM/3 (Newly Promulgated or Revised Laws and Regulations), and WT/ACC/TPKM/4 (The Customs Import Tariff and Classification of Import and Export Commodities: revised edition of August 1995); WT/ACC/TPKM/8/Rev.2 and WT/ACC/TPKM/9/Rev.2 (Information on Industrial Subsidies); WT/ACC/TPKM/10 (Adoption of Codex Standards); WT/ACC/TPKM/12 (Standards for Agricultural and Processed Agricultural Products); WT/ACC/TPKM/13 (List of Commodities Subject to Export Restriction and List of Commodities); WT/ACC/TPKM/14 and Corr.1 and Add.1 (Additional Questions and Replies Concerning Domestic Support and Export Subsidies). In addition, the representative of Chinese Taipei made available to the Working Party the following material:

c

## DECLARATION UNDER U.S.C. §1.131

1. We, Tien-I BAO, Shwang-Min JENG and Syun-Ming Jang, employees of Taiwan Semiconductor Manufacturing Company, are the inventors of the subject matter disclosed in Serial No. 10/618,219 (the "219 application").
2. We conceived the subject matter of the '219 application at least as early as December 12, 2000, on which date we filled out an invention disclosure form of the Taiwan Semiconductor Manufacturing Company, a copy of which is attached hereto as Exhibit A.
3. Upon information and belief, the invention disclosure form that described the subject matter of the '219 application was provided to the Taiwan Semiconductor Manufacturing Company legal department for the purpose of determining whether a patent application should be pursued.
4. Upon information and belief, the Taiwan Semiconductor Manufacturing Company legal department regularly and periodically reviews invention disclosure forms that are submitted for the purpose of determining whether patent applications should be prepared and filed.
5. Upon information and belief, it was determined that a patent application should be prepared and filed based upon our invention disclosure and that the invention disclosure was referred to outside counsel for preparation of a patent application.
6. Upon information and belief, this application was prepared through the cooperative effort of Daniel R. McClure and individuals of a patent firm in Taiwan.
7. The preparation of this application required a back-and-forth exchange of information, drafts, and comments, until the application was finalized for filing.

8. Upon information and belief, a copy of the formal declaration for the patent application was provided to the Taiwan Semiconductor Manufacturing Company legal department by June 13, 2003 under cover letter of declaration for patent application and power of attorney. (Exhibit C)

9. On June 13, 2003, we reviewed the final draft of the patent application and signed the formal declaration, which was then returned to Daniel R. McClure for filing with the U.S. Patent and Trademark Office (U.S.P.T.O.).

10. Upon information and belief, the patent application that is now identified as the '219 application was filed with the U.S.P.T.O. on July 10, 2003.

We hereby declare: (a) that all statements made herein of our own knowledge are true; (b) that all statements made on information and belief are believed to be true; (c) that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code; and (d) that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Tien-I BAO

Tien-I BAO  
Date: 12/13/2004

Shwang-Min JENG

Shwang-Min JENG  
Date: 12/13/2004

Syun-Ming JANG

Syun-Ming JANG  
Date: 12/13/04

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Encl: b: A

**tsmc** 台灣積體電路

**TSMC INVENTION DISCLOSURE**

EMP. NO.	FULL NAME(S) OF INVENTOR(S)		DEPT.	DEPT. CODE	TEL. NO.	SECURITY B TSMC-RESTRICTED
	ENGLISH Ex: Da-Tung Lee	CHINESE Ex: 李大同				FOR USE BY PATENT AFFAIRS DEPARTMENT
009604	Tien-I Bao	包天一	TFD	2331	7033586	DISCLOSURE NO.:
008774	Lain-Jong Li	李進忠	TFD	2331	7033460	TSMC02000-0856
006931	Shwang-Ming Jeng	鄭望銘	TFD	2331	7033457	RECEIVED DATE:
003615	Syun-Ming Jeng	鄭勳明	TFD	2331	7033458	(TIME STAMP)

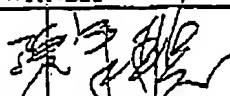
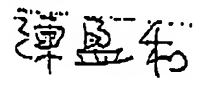
- TITLE OF INVENTION - (ENGLISH ONLY)**  
ENGLISH - METHODS TO RESOLVE LK/CU PR SCUM IN VIA AFTER TRENCH PHOTO DEVELOPMENT
- BACKGROUND INFORMATION - CURRENT PRACTICE AND DISADVANTAGES (ENGLISH ONLY)**  
1. In via first Cu damascene process, NHx (amine) radicals in etch stop (SiN, SiC), and ARL (SiON) films causes PR scum in via after trench photo development.
- MAIN POINTS OF CLAIM (PLEASE LIST ITEM BY ITEM: 利用何種方法/手段達到目的) (ENGLISH ONLY)**  
1. Non-amine or amine barrier for etch stop, ARL to prevent amine radicals diffusion into low K IMD.
- PROBLEM SOLVED OR IMPROVEMENTS OBTAINED BY THIS INVENTION (PLEASE LIST ITEM BY ITEM) (ENGLISH ONLY)**  
1. PR scum in via can be largely improved.
- KEYWORD SEARCH FOR PATENT/LITERATURES (ENGLISH ONLY)**  
PR scum
- PATENT/LITERATURES SEARCH RESULT (PLEASE SPECIFY SIMILAR PATENT NO. AND LITERATURE CITATION) (ENGLISH ONLY)**  
No similar found
- DETAIL DESCRIPTION OF INVENTION (ENGLISH ONLY)**  
PR scum in via after trench photo development is a serious problem in CL013 (and below) LowK/Cu process. NHx (amine) based radicals interact with PR is the key mechanism. How to eliminate or block amine radical in IMD becomes one possible solution. There are two amine sources in lowK/Cu damascene IMD deposition. One is etch stop layer, SiN or SiCN, another is anti-reflection layer (ARL) SiON. Here announce several non amine or amine barrier materials to resolve PR scum.

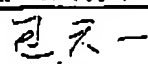
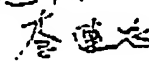
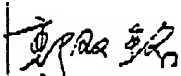
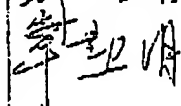
For etch stop, ARL and barrier: SiOx PECVD using silicon source gases: SiH4, Si2H6, SiF4, TEOS, alkyl-silane (alkyl= methyl, ethyl, propyl...) and oxidant gases: O2, CO2, CO, H2O, H2O2 and carrier gases: Ar, He, CH4 mixture, spin-on glass, BARC...

Scheme: 1. Etch stop/lowK IMD/barrier/ARL 2. Etch stop/barrier/lowK IMD/barrier/ARL 3. Etch stop/lowK IMD/ARL 4. Etch stop/barrier/LowK IMD/ARL

**ATTACHMENTS:**

**SECURITY B**  
**TSMC-RESTRICTED**

WITNESS: THE TWO WITNESSES WHOSE SIGNATURES APPEAR BELOW HAVE READ AND UNDERSTOOD THIS ENTIRE INVENTION DISCLOSURE.	SIGNATURE OF WITNESS	DATE	SIGNATURE OF WITNESS	DATE
		12/7		12/7

DISCLOSURE SUBMITTED BY			
INVENTORS' EMPNO	INVENTORS' NAME	INVENTOR'S SIGNATURE	DATE
009604	包天一		12/7
008774	李運忠		12/7
006931	鄭雙銘		12/7
003816	章勳明		12/7

7148xv

7413

$$\underline{E} \sim 1:674 \Delta$$

**tsmc** 台灣積體電路

## TSMC INVENTION DISCLOSURE

EMP. NO.	FULL NAME(S) OF INVENTOR(S)		DEPT.	DEPT. CODE	TEL. NO.	SECURITY B TSMC-RESTRICTED
	ENGLISH Ex: Da-Tung Lee	CHINESE Ex: 李大同				FOR USE BY PATENT AFFAIRS DEPARTMENT
009604	Tien-I Bao	包天一	TFD	2331	7033586	DISCLOSURE NO.:
003774	Lain-Tong Li	李道忠	TFD	2331	7033460	TSMC 2000-0850
006931	Shwang-Ming Jeng	鄭盛銘	TFD	2331	7033457	RECEIVED DATE:
003815	Syun-Ming Jeng	蔣勉明	TFD	2331	7033458	(TIME STAMP)

12/12-2000

- TITLE OF INVENTION - (ENGLISH ONLY)  
ENGLISH - METHODS TO RESOLVE LOWK/CU PR SCUM IN VIA AFTER TRENCH PHOTO DEVELOPMENT
- BACKGROUND INFORMATION - CURRENT PRACTICE AND DISADVANTAGES (ENGLISH ONLY)  
1. In via first Cu damascene process, NHx (amine) radicals in etch stop (SiN, SiC), and ARL (SiON) films causes PR scum in via after trench photo development.
- MAIN POINTS OF CLAIM (PLEASE LIST ITEM BY ITEM: 利用标题方法/ 主题词制表的) (ENGLISH ONLY)  
1. Non-amine or amine barrier for etch stop, ARL to prevent amine radicals diffusion into low K IMD.
- PROBLEM SOLVED OR IMPROVEMENTS OBTAINED BY THIS INVENTION (PLEASE LIST ITEM BY ITEM) (ENGLISH ONLY)  
1. PR scum in via can be largely improved.
- KEYWORD SEARCH FOR PATENT/LITERATURES (ENGLISH ONLY)  
PR scum
- PATENT/ LITERATURES SEARCH RESULT (PLEASE SPECIFY SIMILAR PATENT NO. AND LITERATURE CITATION) (ENGLISH ONLY)  
No similar found
- DETAIL DESCRIPTION OF INVENTION (ENGLISH ONLY)  
PR scum in via after trench photo development is a serious problem in CL013 (and below) LowK/Cu process. NHx (amine) based radicals interact with PR is the key mechanism. How to eliminate or block amine radical in IMD becomes one possible solution. There are two amine sources in lowK/Cu damascene IMD deposition. One is etch stop layer, SiN or SiCN, another is anti-reflection layer (ARL) SiON. Here announce several non amine or amine barrier materials to resolve PR scum.

For etch stop, ARL and barrier: SiO<sub>x</sub> PECVD using silicon source gases: SiH<sub>4</sub>, Si<sub>2</sub>H<sub>6</sub>, SiF<sub>4</sub>, TEOS, alkyl-silane (alkyl= methyl, ethyl, propyl..) and oxidant gases: O<sub>2</sub>, CO<sub>2</sub>, CO, H<sub>2</sub>O, H<sub>2</sub>O<sub>2</sub> and carrier gases: Ar, He, CH<sub>4</sub> mixtures, spin-on glass, BARC...

Scheme: 1. Etch stop/lowK IMD/barrier/ARL 2. Etch stop/barrier/lowK IMD/barrier/ARL 3. Etch stop/lowK IMD/ARL 4. Etch stop/barrier/LowK IMD/ARL

**ATTACHMENTS:**

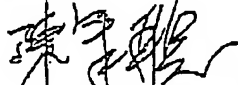
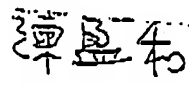
SECURITY B  
TSMC-RESTRICTED

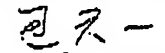
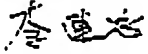
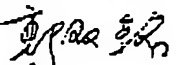
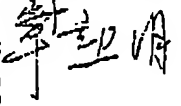


DEC-08-2004 WED 08:46

FAX NO.

P. 09

WITNESS: THE TWO WITNESSES WHOSE SIGNATURES APPEAR BELOW HAVE READ AND UNDERSTOOD THIS ENTIRE INVENTION DISCLOSURE.	SIGNATURE OF WITNESS	DATE	SIGNATURE OF WITNESS	DATE
		12/7		12/7

DISCLOSURE SUBMITTED BY			
INVENTORS' EMPNO	INVENTORS' NAME	INVENTOR'S SIGNATURE	DATE
009604	包天一		12/7
008774	李運忠		12/7
006931	鄭雙銘		12/7
003816	章勳明		12/7